CLAIMS

1. A catheter comprising:

a catheter body that defines an inner lumen;

a probe within the inner lumen that delivers fluid to a tissue site of a patient; and

at least one electrode coupled to the catheter to detect contact between the catheter and the tissue site.

2. The catheter of claim 1, wherein the catheter body directs the probe to the tissue site.

3. The catheter of claim 1, wherein the probe comprises an extendable probe that extends from the catheter body upon the electrode detecting contact between the catheter and the tissue site.

4. The catheter of claim 3, wherein the probe comprises an extendable and retractable probe.

5. The catheter of claim 1, wherein the probe includes a distal tip with at least one exit port to allow fluid to exit the probe.

6. The catheter of claim 5, wherein the distal tip of the probe is formed from an electrically conductive material.

7. The catheter of claim 6, wherein the electrode is coupled to the catheter body and the catheter delivers an electrical stimulus to the tissue site via the electrode coupled to the catheter body and the distal tip of the probe.

8. The catheter of claim 5, wherein the distal tip of the probe comprises a needle.

9. The catheter of claim 5, wherein the distal tip of the probe comprises a helix shaped distal tip.

10. The catheter of claim 5, wherein the electrode is coupled to a distal end of the probe to detect contact between the catheter and the tissue site.

11. The catheter of claim 10, further comprising an electrode coupled to the catheter body and the catheter delivers an electrical stimulus to the tissue site via the electrode coupled to the catheter body and the electrode coupled to the probe.

12. The catheter of claim 1, further comprising a connector interface to couple the catheter to a fluid supply.

13. The catheter of claim 1, further comprising a connecter interface to couple the catheter to a power supply.

14. The catheter of claim 1, wherein the power supply comprises a cardiac pacing device and the catheter is coupled to the cardiac pacing device to deliver cardiac pacing pulses via the electrode.

15. The catheter of claim 1, wherein the fluid delivered to the tissue site contains at least one type of macromolecule.

16. The catheter of claim 15, wherein the macromolecule includes one of deoxyribo nucleic acid (DNA), ribonucleic acid (RNA), a drug, a gene, a peptide, viral or non-viral vector encoding therapeutic genes (DNA) and a protein.

17. The catheter of claim 1, wherein the tissue site of the patient comprises a cardiac tissue site, and the electrode coupled to the catheter detects a cardiac signal indicating contact between the catheter and the tissue site.

18. A method comprising:

electrically sensing contact between a distal end of a catheter and a tissue site of a patient;

delivering a fluid that contains at least one type of macromolecule to the tissue site of the patient via the catheter; and

delivering an electrical stimulus to the tissue site of the patient to enhance transfer of the macromolecules of the fluid to the tissue site via electroporation.

19. The method of claim 18, wherein delivering the electrical stimulus to the tissue site includes delivering the electrical stimulus to the tissue site via the catheter.

20. The method of claim 19, wherein delivering the electrical stimulus to the tissue site via the catheter includes delivering the electrical stimulus to the tissue site via an electrode coupled to the catheter and an electrode coupled to a distal tip of a probe extending from the catheter.

21. The method of claim 19, wherein delivering the electrical stimulus to the tissue site via the catheter includes delivering the electrical stimulus to the tissue site via an electrode coupled to the catheter and a distal tip of a probe extending from the catheter, the distal tip of the probe being formed from an electrically conductive material.

22. The method of claim 18, wherein delivering the electrical stimulus to the tissue site includes delivering the electrical stimulus to the tissue site via an implanted medical device.

23. The method of claim 18, wherein the electrical stimulus delivered to the tissue site comprises a stimulation pulse.

24. The method of claim 18, wherein the electrical stimulus delivered to the tissue site comprises a series of stimulation pulses.

25. The method of claim 18, wherein delivering fluid to the tissue site of the patient via the catheter includes delivering fluid to the tissue site of the patient via one or more exit ports of a distal tip of a probe extending from the catheter.

26. The method of claim 25, wherein the distal tip of the probe comprises a needle.

27. The method of claim 25, wherein the distal tip of the probe comprises a helix shaped distal tip.

28. The method of claim 25, wherein the distal tip of the probe extends from a body of the catheter upon sensing contact between the tissue site of the patient and the catheter.

29. The method of claim 18, wherein the macromolecule includes one of deoxyribo nucleic acid (DNA), ribonucleic acid (RNA), a drug, a gene, a peptide, viral or non-viral vector encoding therapeutic genes (DNA) and a protein.

30. A system comprising:

a fluid supply;

a catheter that includes a catheter body that defines an inner lumen, a probe within the inner lumen that delivers fluid from the fluid supply to a tissue site of a patient, and at least one electrode coupled to the catheter to detect contact between the catheter and the tissue site; and

a power supply to generate an electrical stimulus that is delivered to the tissue site.

31. The system of claim 30, further comprising a pump to drive fluid from the fluid supply through the catheter.

32. The system of claim 30, wherein the power supply comprises an implanted medical device that delivers the electrical stimulus to the tissue site.

33. The system of claim 32, wherein the implanted medical device comprises one of an implantable pulse generator, an implantable cardioverter/defibrillator, and an implantable pacemaker/cardioverter/defibrillator.

34. The system of claim 30, wherein the fluid supply comprises an implanted fluid reservoir.

35. The system of claim 30, wherein the power supply is coupled to the catheter, and the catheter delivers the electrical stimulus to the tissue site.

36. The system of claim 35, wherein the probe includes a distal tip made from an electrically conductive material and the electrode is coupled to the catheter body, and the catheter delivers the electrical stimulus to the tissue site via the electrode coupled to the catheter body and the distal tip of the probe.

37. The system of claim 35, wherein the catheter includes a pair of electrodes, a first electrode coupled to the probe and a second electrode coupled to the catheter body, and the catheter delivers the electrical stimulus to the tissue site via the electrode coupled to the catheter body and the electrode coupled to the probe.

38. The system of claim 30, wherein the electrical stimulus delivered to the tissue site includes a stimulation pulse.

39. The system of claim 30, wherein the electrical stimulus delivered to the tissue site includes a series of stimulation pulses.

40. The system of claim 30, wherein the fluid delivered to the tissue site contains at least one type of macromolecule.

41. The system of claim 40, wherein the macromolecule includes one of deoxyribo nucleic acid (DNA), ribonucleic acid (RNA), a drug, a gene, a peptide, viral or non-viral vector encoding therapeutic genes (DNA) and a protein.